O'Laughlin & Paris LLP

Attorneys at Law

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June 28, 2011

Charlie Hoppin
Frances Spivy-Weber
Tam Doduc
State Water Resources Control Board
1001 I Street
PO Box 2815
Sacramento, CA 95812-2815

Re: June 6, 2011 Workshop

Dear Members of the Board:

At the January 2011 workshop on the flow proceedings for the San Joaquin River, the San Joaquin River Group asked the State Water Board staff and the resource agencies (National Marine Fisheries Service, California Department of Fish and Game and the United States Fish and Wildlife Service) to explain to the public and the State Water Board how increasing flows on the San Joaquin River would lead to increased abundance, population, salmon smolt survival through the south Delta, or escapement. To date, none of the non-governmental organizations or the resource agencies have provided such an explanation.

At the hearing on January 7, 2011, the San Joaquin River Group listed the various water quality constituencies and physical processes that could be affected by flow. We asked, and it seemed to us that you agreed, that the resource agencies should be able to show how these various constituencies or physical processes improved with higher flows to help the San Joaquin River fall-run Chinook salmon smolts migrate through the lower San Joaquin River and south Delta. The resource agencies were permitted to make comments on February 8, 2011, and again during the June 6, 2011 workshop. On every issue from velocity to water stage, water temperature, turbidity, flood, etc., no quantifiable scientific evidence was provided to support the belief that the higher flows will improve any or all of these elements. Why? Because there is no science to support the "belief."

If it wasn't so pathetic, it would be comical that the one attempt to support increased flows was a hand-drawn caricature by the United States Fish and Wildlife Service regarding the benefits of floodplain habitat. We said it then and we will say it now—the proposed flow regimes for Vernalis (1) will not inundate the proposed sites identified by the Department of Fish and Game;

117 Meyers St., Suite 110
Post Office Box 9259
Chico, California 95927-9259

530.899.9755 tel
530.899.1367 fax

(2) will not inundate them for any duration; (3) will be extremely costly in terms of water; (4) have no quantifiable or qualitative benefit; and (5) are outside the project scope.

I.

a. The first site identified by DFG over refuge lands is above the Merced/San Joaquin Rivers confluence and therefore outside the scope. The current draft has Friant excluded from the analysis, so it is unclear how these lands will become inundated by a Vernalis' flow objective;

b. The Tuolumne, Stanislaus and Merced Rivers' sites do not become inundated until flows reach 5,000-6,000 cfs. All of these sites are outside the project scope. In addition, how much floodplain would be inundated and at what flows was not provided by the DFG, nor were there any agricultural or developed sites identified that would experience flooding in these flows; and

c. The San Joaquin River between the Stanislaus River and Mossdale is approximately 56 percent of the available floodplain, or 1,600 acres over 17 miles (4 acres/miles), can be inundated between 10,000 to 25,000 cfs, and that up to 74 percent of the available floodplain, or 2,100 acres, can be inundated up to 25,000 cfs.

II. Even at a percent unimpaired, it is unknown at what percentage the floodplains will be inundated and to what extent. Also, the percentage that is unimpaired will rise and fall during the time-period, leading to stranding problems. Finally, the length and exposure to receive the supposed benefits as seen in the Cosumnes River study is 30 consecutive days![1] Present unimpaired cannot guarantee "consecutive."

III. If you need to inundate for 30 days, that would be a minimum of 300,000 acre feet from each tributary, for just that 30 days. This is in two watersheds with an annual 1,000,000 acre-foot runoff. The river still needs to flow for the other 335 days and there is storage, recreation, power, municipal and agricultural demands that need to be met.

IV. To date, not one scientist has opined how much escapement or population will improve even if these floodplains are inundated. Instead, we continue to see the same photo of captured smolts lined up on the top of an Igloo cooler with the explanation that the larger ones were reared in the floodplain and the smaller ones were not. Not one scientist has opined on how having a floodplain on the Merced

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[1] One note of interest: The California Department of Fish and Game keeps saying that we need cooler temperatures to protect the salmon smolts. Please note the enclosed article wherein the author states, "If water is too cold, juvenile salmon are lethargic and growth is slow." Conversely, if temperatures warm up, it improves salmon smolt growth. So, which one is it? When this article was mentioned at the June 6, 2011 workshop, one representative from the resource agencies opined (without any evidentiary support) that there is more food available in the warmer floodplain, which then begs the question, "If that is so, then wouldn't warmer *river* water also produce more food?"

River will benefit salmon smolt survival through the lower San Joaquin River and the south Delta.

So, the one physical property that may improve with increased flows is not in the project scope, is not quantifiable, and provides no nexus to successful migration through the lower San Joaquin River and south Delta.

We reiterate our request to you, that you demand that the resource agencies provide you with the data and analysis to support their beliefs.

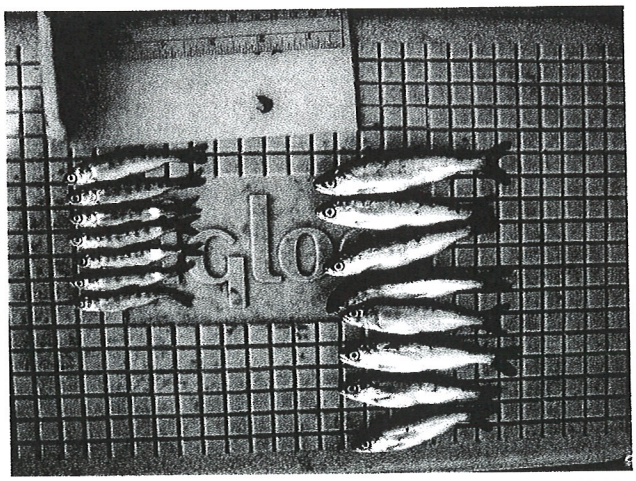
Very truly yours,
O'LAUGHLIN & PARIS LLP

TIM O'LAUGHLIN

TO/tb
Enclosure
cc (via email only): Thomas Howard
San Joaquin River Group Authority

California WaterBlog
A biologist, economist, engineer and geologist walk onto a bar...

Carson Jeffres, fish ecologist, UC Davis Center for Watershed Sciences



Juvenile Chinook salmon reared on a restored floodplain on the Cosumnes River (right) and in the main channel (left): Jeff Opperman photo

Spring is here, temperatures are warming, and juvenile salmon have filled the floodplains—a link for them between the gravel bedded rivers where they hatched and the ocean where they will spend the next one to five years. Although salmon may only use the floodplain for a month or two, this could mean the difference between success and failure in their long journey to the ocean and back again. When juvenile salmon spend time on the floodplain, they grow faster than those that use only the river channel during their migration to the ocean (Sommer et al. 2001, Jeffres et al. 2006). Because of the increased growth, the juveniles are larger when they head out to sea; they can survive better by swimming faster and being more able to avoid predators.

What makes a floodplain a good place for rearing salmon? First of all, it needs to be connected to the river. This sounds obvious, but most of the floodplain habitat in California is isolated behind levees and only gets flooded during extreme high water events when the levees are overtopped or breached. The reason that the levees are there is to protect housing and agricultural land (orchards, vineyards, etc.), which doesn't allow for regular inundation of floodwaters.

Despite these challenges, some floodplains are still active in California and studies of these active floodplains are changing our minds about their value. Multi-purpose floodplains such as the Yolo Bypass and Cosumnes River Preserve, for example, provide flood protection, seasonal agricultural land for annual crops, and restored habitat for many species, not just salmon.

Flooded oaks on the Cosumnes River floodplains

Why are these multi-purpose floodplains better than the river channel for rearing salmon? As cold floodwater enters a floodplain from the river, it spreads out, slows down and deposits sediment. Throughout this process, the water also warms slightly. This is essentially the priming of the productivity pump that will ultimately feed the juvenile salmon for the next couple of months. As the water slows, clears and warms, phytoplankton and algae begin to grow. Populations of animals that feed on the fast-growing plant life, such as zooplankton and other aquatic invertebrates boom. These animals comprise the main food of juvenile salmon on the floodplains.

Because salmon are cold blooded, water temperature it is an important component to floodplain suitability. If water is too cold, juvenile salmon are lethargic and growth is slow. If the water is too warm it causes increased metabolic demands and reduced dissolved oxygen, inhibiting growth and increasing mortality. Fortunately for California salmonids, out-migration is in the spring when temperatures are generally moderate. The timing of spring high flows onto floodplains allows for ideal temperatures for juvenile salmonids compared to the relatively cold water in the main river channel. When temperatures are good and food is abundant, juvenile salmon can grow at impressively fast rates, especially when compared to fish using the main river channel.

The combination of complex physical processes and ecological function is what separates the floodplain from the river corridor in the eyes of juvenile salmon. Leveed river channels provide little complexity and less than ideal growing conditions during the annual spring out-migration. When juvenile salmon have access to complex floodplain habitats where temperatures are good and food resources are abundant, they will grow to larger sizes and thus be able to survive better than fish that remained in the main river channel.

So, next time you catch a big healthy salmon, thank your local floodplain.

Further Reading:

Jeffres, C., J. Opperman and P. Moyle (2008), "Ephemeral floodplain habitats provide best growth conditions for

juvenile Chinook salmon in a California river," *Environmental Biology of Fishes* 83 (4): 449-458.

Sommer, T., B. Harrell, M. Nobriga, R. Brown, P. Moyle, W. Kimmerer and L. Schemel (2001), "California's Yolo Bypass: Evidence that flood control can be compatible with fisheries, wetlands, wildlife and agriculture," *Fisheries* 26 (8): 6-16.